SAT Report

PMN Number: **P-13-0367**
SAT Date: **4/12/2013**
Print Date: **8/19/2014**

Related cases: [redacted]

Concern levels:

Type of Concern:	**Health**	**Eco**	**Comments**
Level of Concern:	1-2	1	

Persistence	**Bioaccum**	**Toxicity**	**Comments**
3	1	1	
		Awaiting Human Health Entry	
		Awaiting Human Health Entry	
		Awaiting Human Health Entry	

Exposure Based Review:

Health:
Ecotox: No

Routes of exposure:

Health: Dermal Inhalation
Ecotox: No releases to water
Fate: ;

Keywords:

Keywords:

Summary of Assessment:

Fate:

Fate Summary: P-13-0367

[redacted]

Solid
S > 10 g/L at 25 °C (E)
VP < 1.0E-6 torr at 25 C (E)

BP > 400 C (E)
H < 1.00E-8 (E)
POTW removal (%) = 0-50 via sorption; OECD 306 Aerobic Biodeg. in Seawater: 1.6-10.3%/28d; Scaletreat 05-143: OECD 306 Aerobic Biodeg. in Seawater: 14.2-32.0%/28d,14.2-34.2%/62d.
Time for complete ultimate aerobic biodeg > mo
Sorption to soils/sediments = moderate - strong
PBT Potential: P3B1
*CEB FATE: Migration to ground water = slow - moderate

Health:

Health Summary: Not absorbed through the skin, absorbed from the lung; poor absorption of the low molecular weight fractions [redacted] from the GI tract (pchem). Concern for irritation to eyes, lungs, and mucous membranes based on the pH of the PMN substance (pH = 3.8). Also concern for effects on blood clotting and muscle and developmental toxicity based on [redacted]

Ecotox:

Test Organism	Test Type	Test End Point	Predicted	Measured	Comments
fish	**96-h**	**LC50**	>100	>100	
daphnid	**48-h**	**LC50**	>100		
green algal	**96-h**	**EC50**	9.5	>100	
fish	**_**	**chronic value**	>10		
daphnid	**_**	**chronic value**	>10		
algal	**_**	**chronic value**	5.0	>10	
Sewage Sludge	**3-h**	**EC50**	**_**		
Sewage Sludge	**_**	**Chronic Value**	**_**		

Ecotox Values Comments:

Factors	Values	Comments
Assessment Factor	10	
Concentration of Concern (ppb)	1000	
SARs	polyanionic polymers	
SAR Class	polymer-anionic [redacted]	
Ecotox Category		

Ecotox Factors Comments:

SAT Chair: L Keifer 564-8916

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Focus Report

New Chemicals Program

PMN Number: **P-13-0367**

Focus Date:	04/17/2013 11:00:00 PM	Report Status:	Completed
Consolidated Set:			
Focus Chair:	Brian Lee	Contractor:	Jean Quenneville

I. Notice Information

Submitter: [redacted]

CAS Number: [redacted]

Chemical Name: [redacted]

Use: Scale inhibitor in oilfield applications. The PMN material is used as a component of the well additive package for hydraulic fracturing [redacted] Analog [redacted]

Other Uses: No other uses were found.

PV-Max: [redacted]

Manufacture: Import: X

II. SAT Results

(1) **Health Rating:** 1-2 **Eco Rating:** 1 **Comments:** ;

Occupational: 1D **Non-Occupational:** NR **Environmental:** NR

(1) **PBT:** 3 1 1 **Comments:**

III. OTHER FACTORS

Categories:

Health Chemical Category: Ecotox Category: polyanionic polymers

Related Cases/Regulatory History:

Health related Cases:

Ecotox Related Cases: Analogs: [redacted].

Regulatory History: [redacted]-WITHDRAWN/FACE 5E

[redacted]-Drop

MSDS/Label Information:

MSDS: Yes Label: No

General Equipment: Wear suitable protective clothing, gloves and eye/face protection (safety goggles; face shield)

Respirator: General Usage: not required

Health Effects: Corrosive; causes burns. Harmful if swallowed. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

TLV/PEL (PMN or raw material): - None for the PMN substance

Exposure Based Information:

Exposure Based Review: N

Exposure Based Review (Eco): N

Exposure Based Review (Non Occupatuional):

Exposure Based Review (Health):

Exposure Based (Occupational): No

Exposure Based (Environmental):

IV. Summary of SAT Assessment

Fate:

Fate Summary: P-13-0367

FATE: MW = [redacted]
Solid
S > 10 g/L at 25 °C (E)
VP < 1.0E-6 torr at 25 C (E)
BP > 400 C (E)
H < 1.00E-8 (E)
POTW removal (%) = 0-50 via sorption; OECD 306 Aerobic Biodeg. in Seawater: 1.6-10.3%/28d; Scaletreat 05-143: OECD 306 Aerobic Biodeg. in Seawater: 14.2-32.0%/28d,14.2-34.2%/62d.
Time for complete ultimate aerobic biodeg > mo
Sorption to soils/sediments = moderate - strong
PBT Potential: P3B1
*CEB FATE: Migration to ground water = slow - moderate

Health:

Health Summary: Not absorbed through the skin, absorbed from the lung; poor absorption of the low molecular weight fractions [redacted]) from the GI tract (pchem). Concern for irritation to eyes, lungs, and mucous membranes based on the pH of the PMN substance (pH = 3.8). Also concern for effects on blood clotting and muscle and developmental toxicity based on chelation of calcium and magnesium.

Ecotox:

Ecotox Values:

Fish 96-h LC50:	>100(P)	>100(M)
Daphnid 48-h LC50:	>100(P)	
Green algal 96-h EC50:	9.5(P)	>100(M)
Fish Chronic Value:	>10(P)	
Daphnid ChV:	>10(P)	
Algal ChV:	5.0(P)	>10(M)

Ecotox values comments: Predictions are based on SARs for polyanionic polymers; SAR chemical class = polymer-anionic-COO/SO3/PO3-chelator; MW [redacted]; S > 100 g/L at 20 C (M); pH7; effective concentrations based on 100% active ingredients and mean measured concentrations; hardness <180.0 mg/L as CaCO3; and TOC <2.0 mg/L;

Ecotoxicity Test Data Results for P-13-0367: [redacted]

Acute ecotoxicity tests were conducted with fish, copepods, and algae in 2005 on P-13-0367 by [redacted] The PMN material is a yellow-brown liquid with an estimated vapor pressure of <1 x 10-8 mm Hg at 25 °C. The water solubility of the PMN material in seawater is 1 g/L at 25 °C. The sorption to soils and sediments is estimated to be moderate to strong and the time to complete ultimate aerobic biodegradation is estimated to be greater than months. The three studies are reviewed below.

Fish Ecotoxicity Test:
[redacted] conducted a 96-hour acute toxicity test with sheepshead minnow (Cyprinodon variegatus) and Scaletreat 05-143 (purity unknown; composition: 90% P-13-0367, 10% 2-aminoethanol) under static-renewal conditions with 48-hour renewal. This study was reported to follow PARCOM 1995 Part B: Protocol for a fish acute toxicity test. A single replicate of ten C. variegatus were exposed to a natural seawater control or the test substance at the nominal test concentration of 1000 mg/L. Analytical monitoring was not conducted. Test solutions of the test item in seawater were prepared in accordance with OSPAR Guidelines for Toxicity Testing of Substances and Preparations Used and Discharged Offshore, following preliminary observations of its behavior in seawater. A mixture of 1 g of the test item in 1 liter of reference seawater was shaken vigorously, upending for 10 reversals of the contents. This was allowed to stand for 4 hours and then examined. Over the course of testing, temperature ranged from 20.1 – 20.5˚C, pH ranged from 6.72 – 8.06, dissolved oxygen ranged from 95 – 99% saturation and salinity ranged from 33.5 – 34.0%. No mortalities occurred during the test. Based on the nominal test concentration, the 96-hour LC50 was determined to be greater than 1000 mg/L. This is an

acceptable test for the purposes of concentration of concern determination within OPPTS.
96-hour LC50 > 1000 mg/L

Aquatic Invertebrate Ecotoxicity Test:
[redacted] conducted a 48-hour acute ecotoxicity test with copepods (Acartia tonsa Dana) with Scaletreat 05-143 (purity unknown; composition: 90% P-13-0367, 10% 2-aminoethanol) under static conditions. This study was reported to follow ISO 14669; 1999: Water Quality – Determination of the acute lethal toxicity to marine copepods. Four replicates of five A. tonsa were exposed to a natural seawater control or the test substance at nominal test concentrations of 27.6, 81.7, 241, 729 and 2208 mg/L. Analytical monitoring was not conducted. Test solutions of the test item in seawater were prepared individually at each test concentration in accordance with current OSPAR Guidelines for Toxicity Testing of Substances and Preparations Used and Discharged Offshore, following preliminary observations of its behavior in seawater. A mixture of 1 g of the test item in 1 liter of reference seawater was shaken vigorously, upending for 10 reversals of the contents. This was allowed to stand for 4 hours and then examined. The test temperature was maintained at 20 ± 2˚C and pH ranged from 6.33 – 8.11. A loading of 200 copepods/L was calculated. No mortalities occurred during the test. Based on nominal test concentrations, the 48-hour EC50 was determined to be greater than 2208 mg/L. This is not an acceptable test for the purposes of concentration of concern determination within OPPTS due to the test species chosen.
48-hour LC50 > 2208 mg/L

Algal Ecotoxicity Test:
[redacted] conducted a 72-hour algae ecotoxicity test in Skeletonema costatum with Scaletreat 05-143 (purity unknown; composition: 90% P-13-0367, 10% 2-aminoethanol) under static conditions. This study was reported to follow ISO 10253; 1995: Water Quality – Marine algal growth inhibition test with Skeletonema costatum and Phaeodactylum tricornutum. Three replicates of S. costatum were exposed to the test substance at nominal test concentrations of 320, 559, 998, 3199 and 5600 mg/L. Six replicates of S. costatum were exposed to a test medium control (natural seawater [35%] + ISO media). The algae were illuminated with a light intensity of 67.8 – 76.1 µmol/m2/s with constant shaking. Test solutions of the test item in seawater were prepared in accordance with current OSPAR Guidelines for Toxicity Testing of Substances and Preparations Used and Discharged Offshore, following preliminary observations of its behavior in seawater. A mixture of 1 g of the test item in 1 liter of reference seawater was shaken vigorously, upending for 10 reversals of the contents. This was allowed to stand for 4 hours and then examined. The test temperature ranged from 19.0 – 19.5˚C. The pH ranged from 5.78 – 5.88 in the highest concentration and from 8.07 – 8.76 in the control. Based on nominal test concentrations, the 72-hour EC50 for growth rate was determined to be 1101 mg/L. The 72-hour NOEC and LOEC values were 320 and 559 mg/L, respectively. The 72-hour algal chronic value (ChV) was 423 mg/L. This is an acceptable test for the purposes of concentration of concern determination within OPPTS.
72-hour EC50 (growth rate) = 1101 mg/L
72-hour NOEC (growth rate) = 320 mg/L
72-hour LOEC (growth rate) = 559 mg/L
72-hour ChV (growth rate) = 423 mg/L

Conclusions:
The fish (96-hour LC50 > 1000 mg/L) and algal (72-hour EC50 (growth rate) > 1101 mg/L and 72-hour ChV = 423 mg/L) toxicity tests conducted with P-13-0367 were considered acceptable for the purposes of concentration of concern determination within OPPTS. The acute copepod toxicity test is not an acceptable test due to the test organism selection. For comparative purposes, the fish (96-hr LC50), acute daphnia (48-hr EC50), and algal (96-hr EC50) toxicity values, based on SARs for P-13-0367, are >100 mg/L, >100 mg/L, and 9.5 mg/L, respectively. In addition, based on the same SAR equations, the fish, daphnia, and algal chronic values for P-13-0248 are >10 mg/L, >10 mg/L, and 5.0 mg/L, respectively. Since the aquatic invertebrate toxicity test is not acceptable, SAR predictions will be used for the purposes of concentration of concern determination for that ecotoxicity endpoint. The acute concentration of concern (CoC) is calculated by dividing the 96-hr acute toxicity value for C. variegatus by an uncertainty factor of 5 yielding 200,000 ppb (1,000,000 µg/L / 5). The highest default acute CoC is 20,000 ppb and will be used for CoC determination. The chronic concentration of concern for P-13-0367 is calculated by dividing the algal chronic

value (423 mg/L) by an uncertainty factor of 10 yielding 42,300 µg/L or 42,300 ppb. The highest default chronic CoC for P-13-0367 is 1,000 ppb and will be used for CoC determination.

The acute CoC = 20,000 ppb
The chronic CoC = 1,000 ppb

Ecotox Study Reviewer: J. Gallagher
April 15, 2013

Ecotox Factors:

Assessment Factor:	10
Concern Concentration:	1000

V. Summary of Exposures/Releases

Engineering Summary: P-13-0367

Exposures/Releases	Release	Release	Release
Scenario	**Use: Corrosion Inhibitor for Oilfield Applications**	**Use: Corrosion Inhibitor for Oilfield Applications**	**Use: Corrosion Inhibitor for Oilfield Applications**
Sites	[redacted]	[redacted]	[redacted]
Media	[redacted]	[redacted]	[redacted]
Descriptor A	High End	Output 2	Output 2
Quantity A (kg/site/day)	[redacted]	[redacted]	[redacted]
Frequency A (day/year)	[redacted]	[redacted]	[redacted]
Descriptor B			
Quantity B (kg/site/day)			
Frequency B (day/year)			
From	[redacted]	[redacted]	[redacted]
Workers			
Exposure Type			

Engineering Summary: Exposures/Releases	Release	Exposure	
Scenario	**Use: Corrosion Inhibitor for Oilfield Applications**	**Use: Corrosion Inhibitor for Oilfield Applications**	
Sites	[redacted]	[redacted]	
Media	[redacted]	[redacted]	
Descriptor A	Output 2	High End	
Quantity A (kg/site/day)	[redacted]	[redacted]	
Frequency A (day/year)	[redacted]	[redacted]	
Descriptor B			
Quantity B (kg/site/day)			
Frequency B (day/year)			
From	[redacted]	[redacted]	
Workers		[redacted]	
Exposure Type		Liquid	

VI. Focus Decision and Rationale

Regulatory Actions

Regulatory Decision: PMN Drop Decision Date: 04/17/2013
Type of Decision:

Rationale: P-13-0367 was dropped from further. Human health hazard concerns were low-moderate for dermal and inhalation exposures. Potential risks to workers were addressed by negligible vapor exposure and appropriate dermal PPE. Ecotoxicity hazard concerns were low based on submitted test data for polyanionic polymers. Potential risks to the environment were low due to no exceedances of the COC during the release period.

COC: Chronic – 1,000 ppb, Acute – 20,000 ppb

Summary of Exposures and Releases

Use

[redacted]

P2 Rec Comments:

Testing:

Final Recommended:

Health:
Eco:
Fate:
Other:

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